

**REMARKS**

The Examiner's indication that claims 46-72 contain patentable subject matter is noted with appreciation.

The present invention is a device for emitting waves in an underground formation and a method of generating in an underground formation vibrational signals according to an oriented emission pattern. A device for emitting waves in an underground formation in accordance with an embodiment of the invention includes at least one vibrator V including two slabs 2, 3, at least one motive of element 1 (which may be a piezoelectric or magnetostrictive material) suited to generate vibrations and to communicate the vibrations to the slabs, and a generator 6 for applying periodic signals to the at least mode of element, where the at least one vibrator is positioned in a well W or cavity and embedded in at least one solid material 7 providing coupling thereof with the underground formation, the at least one material being in contact with the two slabs over at least part of each of the faces thereof, and where the at least one vibrator comprises means for further increasing coupling of the at least one vibrator with the at least one solid material. The means for increasing coupling of the vibrator with the solid material is disclosed as the anchor bar 9 and/or perforations 8 as illustrated in the two slabs 2, 3. See paragraph [0039] of the Second Substitute Specification. As may be seen from paragraph [0041] of the Second Substitute Specification, it is stated that "[a]ccording to the embodiment of Fig. 5, each slab 2, 3 comprises as installed at least two plates 2a, 2b arranged and parallel to one another and connected by anchor rods 9. See also see paragraph [0040] of the Second Substitute Specification.

Claims 45 and 73-77 stand rejected under 35 U.S.C. §102 as being anticipated by WO 02/50572. Further it is noted for purposes of the record that U.S. Patent 7,104,357, also to Baroni et al, claims priority under the aforesaid applied Baroni et al publication. Specifically, the Examiner reasons as follows:

Baroni et al disclose a device for emitting waves into formation, the device comprising: at least one vibrator (4,5); two plates (2,3); at least one motive element (the electric elements of the electromechanical transducers 4 and 5) suited to generate vibrations and to communicate them to the plates; and a generator (7) for applying periodic control signals to the motive element.

Figure 1 shows the vibrator positioned in a cavity and embedded in at least one solid material C to provide coupling thereof with an underground formation, with the material [C] being in contact with the end faces of the plates via a material 6.

With respect means for further increasing coupling of the at least one vibrator with the at least one solid material it is noted that cement C provides a rigid surface to receive the motive force of the plates, and as such, increases coupling.

The functions recited by claims 73-77 read on the device of figure 1 when operated by the control signal generator 7 (emphasis added).

These grounds of rejection are traversed for the following reasons.

Claim 45 recites a device for emitting waves in an underground formation comprising at least one vibrator including two slabs...wherein the at least one vibrator...is embedded in at least one solid material providing coupling thereof with the underground formation, the at least one material being in contact with the two slabs...and wherein the at least one vibrator comprises means for further increasing coupling of the at least one vibrator with the at least one solid material (emphasis added). Therefore, it is seen that the at least one solid material contacts the two slabs and the means for further increasing coupling of the at least one vibrator

increases coupling with the at least one solid material provides an enhancement of coupling by reciting "further increasing".

First in Baroni, the sheath 6 is between the slabs 2 and 3 and therefore, the at least one material C is not in contact with the slabs.

Moreover, the means for further increasing coupling must be an additional material beyond the solid material C to which the Examiner refers. The Examiner's construction reads "[w]ith respect means for further increasing coupling of the at least one vibrator with the at least one solid material it is noted that the cement C provides a rigid surface to receive the mode of force of the plates 2 and 3 and as such, increases coupling." However, there is no structure in Baroni which further increases coupling beyond the material C. Accordingly, the only material which could be considered from a structural viewpoint to meet the limitation of further increasing coupling is the elastic layer 6.

Column 5, lines 3 and 4 of the '357 Patent describe an elastic sheath 6 which is positioned between the vibrators 2 and 3 and the solid material which is intended to externally insulate vibrator V. Moreover, the layer 6 is described in column 8, lines 32-41, as providing contact with a mass of cement "to interpose, between one of the plates a medium layer of material having a different acoustic quality; an elastomer layer". To the extent that the elastomer 6 is interpreted to be a means for coupling, it cannot be properly interpreted as further increasing coupling since an elastomer would not be understood by a person of ordinary skill in the art to increase coupling of the vibrator beyond that provided by the solid material C because the elastomer 6 is not rigid. A non-rigid elastomer will not increase coupling and would be understood by a person of ordinary skill in the art to decrease coupling as

explained above. Therefore, Baroni does not comprise "means for further increasing coupling of the at least one vibrator with the at least one solid material" since the operation of the elastomer would be to attenuate or reduce coupling below that provided by the cement C.

The maximum coupling that could be achieved between the vibrators 2 and 3 of Baroni et al and the cement C would be when, as taught in column 8, one of the plates can be brought into contact with the mass of cement or equivalent. The providing of the elastomer 6 therebetween prevents maximum coupling of the energy from the vibrator to the solid material C.

The present invention in contrast provides coupling wherein the vibrator V, as illustrated in Fig. 1, is arranged in a cavity or well W in which a cement or concrete is injected into the well so as to be in intimate contact with vibrating pillar 1. The claimed means for increasing coupling is readable upon the perforations 8 and/or the anchor rods 9 or equivalents thereof. There is no counterpart of the perforations 8 and/or anchor rods 9 or an equivalent in Baroni. The elastomer 6 somewhat insulates the energy of vibrators 2 and 3 from coupling with the solid material C and therefore, provides a diminished coupling.

New claim 48 has been added to further limit claim 45 to recite that the means for increasing coupling is fastened to the slabs which has not counterpart in Baroni et al.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (612.44903X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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